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Signature: Lisa Mansur

PATENT APPLICATION
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WEAPON FOR LETHAL AND NON-LETHAL USES

INVENTORS:
Milan Cerovic
David Dubay

WEAPON FOR LETHAL AND NON-LETHAL USES

FIELD OF THE INVENTION

[0001] Embodiments of the present invention relate to weapons, accessories, and implements.

BACKGROUND OF THE INVENTION

[0002] Conventional weapons directed to a human target include lethal weapons having mounted thereon a mechanically actuated chemical non-lethal weapon.

[0003] Implements and accessories have been mounted on weapons. These include sights, flashlights for illuminating the target, and dispensers for dispensing chemical agents toward the target. Rails including the picattiny rail provide for mounting of mission specific combinations of implements and accessories.

[0004] Without weapons of the present invention and without the apparatus and methods for attaching implements and accessories according to various aspects of the present invention, users of weaponry cannot suitably take advantage of electronic non-lethal implements.

SUMMARY OF THE INVENTION

[0005] A weapon, according to various aspects of the present invention, includes a circuit and an apparatus that provides lethal force and non-lethal force. The circuit includes a switch and a source of illumination, wherein: the circuit controls illumination from the source for aiming the non-lethal force; and the circuit controls release of the non-lethal force in response to operation of the switch.

[0006] By controlling from a circuit the illumination and the release, the arrangement of controls is suitable for reliable use of the weapon.

[0007] A weapon, according to various aspects of the present invention, for use by an operator, includes an apparatus that provides lethal force, non-lethal force, illumination, first and second triggers and a switch. The first trigger is operable with a first hand of the operator for releasing the lethal force. The switch is operable with a second hand of the operator when the second hand is in a position to operate the second trigger. The second trigger is for releasing the non-lethal force. The illumination is controlled in response to operation of the switch.

[0008] A support, according to various aspects of the present invention, is used for attaching an implement to a firearm where the firearm has a rail and a sight bracket. The support includes an apparatus for mechanically coupling the implement to the rail; and an apparatus for coupling the implement to the sight to reduce motion of the implement along the rail parallel to a direction of delivery of the lethal force.

[0009] A support, according to various aspects of the present invention, is used for attaching a non-lethal implement to a firearm where the firearm has a rail and a stop. The support includes a first channel that receives the rail to mechanically couple the non-lethal implement and the rail. The support further includes a first abutment surface that abuts the stop, a first fastener that maintains the first abutment surface against the stop, a second channel that receives the non-lethal implement; and a second fastener that retains the non-lethal implement in the second channel.

BRIEF DESCRIPTION OF THE DRAWING

[0010] Embodiments of the present invention will now be further described with reference to the drawing, wherein like designations denote like elements, and:

[0011] FIG. 1 is a functional block diagram of a weapon according to various aspects of the present invention;

[0012] FIG. 2 is a side view of an implementation of the weapon of FIG. 1;

[0013] FIG. 3 is a side view of support 220 on apparatus 230 of FIG. 1;

[0014] FIG. 4 is a top perspective view of support 220 of FIG. 2;

[0015] FIG. 5 is a bottom exploded view of support 220 and apparatus 230 of FIG. 2; and

[0016] FIG. 6 is a cross-section view of the support 220 installed per FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Weaponry is conventionally designed to operate with high reliability due to its ordinary use in life threatening situations. These situations include conditions that are adverse to mechanical and electronic apparatus such as high and low temperatures, high and low humidities, vibrations, severe mechanical shocks, exposures and submersions in fresh water, snow, salt water, mud, and sand to name a few. Another limitation on reliable operation is the ease with which an operator can properly operate the weapon amid situations that present mental

and physical challenges. These include exhaustion, disorientation, warfare, police activity, and surprise to name a few. Generally, operators train and practice with particular weapons. According to various aspects of the present invention, training and practice with particular weapons having capability to deliver lethal and non-lethal force simplifies training and practice with other weapons due to operational similarities, such as placement of hands for arming, aiming, and firing either lethal or non-lethal force.

[0018] Weapons, according to various aspects of the present invention, perform as discussed above and provide lethal force and electronic non-lethal force. These weapons may be used offensively or defensively with respect to targets both animal and human. For example, weapon 100 of FIG. 1 includes support 102 for implements and accessories, apparatus 104 for lethal force and its actuator 106, apparatus 108 for non-lethal force, a circuit 112 and switches 114 used in part to activate non-lethal force, and apparatus 110 for providing illumination.

[0019] Support 102 provides mechanical alignment and stability and provides ease of mounting for mission specific implements and accessories of conventional types such as scopes, sights, night vision, targeting, illumination, and other apparatus for lethal and non-lethal force. In various implementations of weapon 100, support 102 is integral or rigidly connected to apparatus 104 and provides support for apparatus 108. In other implementations, support 102 is integral or rigidly connected to a combination comprising apparatuses 104, 108 and 110. In other implementations of weapon 100, support 102 is omitted.

[0020] Apparatus 104 and actuator 106 cooperate to provide lethal force in any conventional manner, such as propelling a projectile. Actuator 106 may be a mechanical trigger that activates apparatus 104 to deliver lethal force. Consistent with the purposes for weapon 100, apparatus 104 may include conventional components (e.g., any hand gun, rifle, carbine, or grenade launcher).

[0021] Apparatus 108, circuit 112, and switches 114 cooperate to provide non-lethal force. In various implementations, apparatus 108 circuit 112 and switches 114 are electronic, for instance being of the type described in US Patents 3,803,463; 5,654,867; 6,256,916; 6,636,412; and Applications 10/364,164; and 10/447,447. Electromechanical switches 114 may include a safety switch and a trigger switch that provide conventional electrical signals in response to manual operation by the operator of weapon 100. Operation of the safety switch arms weapon 100 for delivery of non-lethal force. Subsequent operation of the trigger switch activates

apparatus 108 to deliver non-lethal force. Circuit 112 receives signals from switches 114, for example, including indicia of operation of the safety and trigger switches discussed above. According to various aspects of the present invention, circuit 112 may include a battery, a high voltage power supply, and control circuits for operating apparatuses 108 and 110.

[0022] Apparatus 110 provides illumination. In implementations according to various aspects of the present invention, illumination may be generally directed toward the target (e.g., a flashlight beam), and/or provide guidance for aiming weapon 100 (e.g., a laser targeting spot on the target). Apparatus 110 is controlled by circuit 112, for example, to provide illumination in response to arming of apparatus 108 (e.g., responsive to arm switch discussed above). Apparatus 110 may be disabled or omitted in other implementations of weapon 100, for example, when illumination may decrease operator safety.

[0023] By controlling one or more apparatuses of weapon 100 from a circuit and switches as discussed above, switches may be located economically at positions that are suitable for reliable operation. For example, actuator 106 for apparatus 104 may be located for use by an operator's right hand (e.g., for a right handed operator); and switches 114 may be located for use by the operator's left hand (or vice versa for a left handed operator). Training and practice may associate lethal force with the right hand and non-lethal force with the left hand. Such training and practice may simplify training with other weapons having different forms of lethal force, and/or different forms of non-lethal force. Illumination as discussed above is of a non-lethal nature. Consistently, operation of illumination apparatus 110 from switches 114 located for use by the operator's left hand reinforces the non-lethal functions served by the left hand.

[0024] Weapon 100 may include a conventional weapon for apparatus 104 and activator 106. For example, weapon 200 of FIG. 2 includes a conventional M16 automatic weapon, well known for military use. Weapon 200 includes stock 202, firing assembly 203, barrel 204, hand grip 206, and sight 208 (e.g., corresponding generally to apparatus 104). A mechanical trigger 205 functions as actuator 106 and may include a safety mechanism, reducing the risk of inadvertent operation of trigger 205. Weapon 200 further includes rail 210 (e.g., a picattiny rail) and support 220 (e.g., corresponding generally to support 110). Finally, weapon 200 includes an electronic disabling device 230 (e.g., an integrated implementation corresponding to switches 114, circuit 112, and apparatuses 108 and 110).

[0025] Electronic disabling device 230 (of FIGs. 2-5) includes hand grip 231 and body 233. Body 233 includes a circuit (not shown), safety switch 236, trigger switch 237, flashlight 238, and laser light 239. In various implementations, electronic disabling device may be of the type marketed as model M26 or X26 by Taser International, Inc. Device 230 may further include a display 240 (e.g., LED digits and indicators) coupled to the circuit within body 233 for display of configuration information, operator and factory settings, and a log of the time of each operation of device 230.

[0026] A cartridge 232 is mounted at the front of body 233 for operation; and, a spare cartridge 234 is stored at the base of hand grip 231 (FIG. 5 cartridges are empty). In various implementation cartridges 232 and 234 include darts tethered to the circuit in body 233 and/or electrified projectile(s) charged from the circuit in body 233. For example, electrified projectiles may be of the types described in US Provisional Patent applications 60/509,577 filed October 7, 2003 by Patrick W. Smith et al., and 60/509,480 filed on October 8, 2003 by Patrick Smith et al., and US Patent 5,698,815 to Ragner.

[0027] A support, according to various aspects of the present invention, reliably maintains the attachment and alignment of apparatuses for lethal force, for non-lethal force, and for illumination. Such a support may be manufactured using any conventional processes (e.g., casting, molding, machining). In the implementation shown in FIG. 2, support 220 slides onto a rail and is coupled to a stop.

[0028] For example, support 220 in weapon 200 receives rail 210 and abuts several surfaces of bracket 209. In weapon 200, support 220 slides on rail 210 but is stopped by being coupled to bracket 209 which serves in general as a stop for the sliding motion. Alignment may assure proper aiming of weapon 200 and proper delivery of lethal and/or non-lethal force. For example, cartridge 232 may deliver darts in a suitable vertical plane when fired in an orientation where device 230 is also aligned in that vertical plane. The support may be registered with each apparatus using any conventional mechanical technique (e.g., abutted, channeled, journaled, or using a key or post fitting a mating structure of the support or the apparatus).

[0029] Support 220, of FIGs. 2-6, includes left member 410 and right member 450. Members 410 and 450 are joined by fasteners to simultaneously grasp a stop (e.g., sight bracket 209) (fastener 222); device 230 (fastener 224); and rail 210 and device 230 (fastener 226). Fasteners may be of any number and type including for example, spring loaded pins and threaded

screws (as shown), quarter-turn fasteners (and variations such as half turn), bayonet couplings, clamps, cams, levers, and latches. Spring loading permits separation of members 410 and 450 sufficient to separate device 230 from weapon 100 while maintaining the fasteners 222-226 partially threaded together.

[0030] Support 220 in an alternate implementation attaches independently to one or more apparatuses (e.g., 104, 108, 110 in any combination of two groups) facilitating separation of apparatuses (e.g., by quick release fastener(s)) for change of mission, replacement, or functional substitution (e.g., upgrade). Support 220 may be implemented with a set of cooperating structures, each integral to any combination of apparatuses 104, 108, and 110. For example, in one such implementation, device 230 comprises an integral first structure for fastening with or to a rail (e.g., 210); apparatus 108 comprises a second structure (e.g., a rail and stop); and device 230 further comprises an integral third structure for fastening with or to the second structure.

[0031] Support 220 (FIGs. 4 and 6) includes structures that cooperate with a stop. Step top 411 and step side 413 may abut bracket surfaces 611 and 613 respectively. Lip 417 partially surrounds bracket 209 at surface 617. Bevel 419 locates bracket surface 619. Step top 423 abuts bracket surface 623. Step side 425 may abut rail 210. Channel 427 with wedge shaped grooves 429 accepts rail 210. Screw 222 is in contact with stop surface 621 to maintain surfaces 435 and 635 in abutting contact.

[0032] Support 220 (FIGs. 5 and 6) includes structures that cooperate with device 230. Four posts 511 (551) on each member 410 (450) accept four recesses 505 on each side of device 230. Channel 515 (555) follows the contour 615 of the top of device 230. Rear surface 517 (557) abuts surface 643 of device 230. In addition, pins 501-502 support springs 503-504 and locate members 410 and 450. Screws 224 and 226 are received by threaded inserts 506 and 508.

[0033] The foregoing description discusses preferred embodiments of the present invention which may be changed or modified without departing from the scope of the present invention as defined in the claims. While for the sake of clarity of description, several specific embodiments of the invention have been described, the scope of the invention is intended to be measured by the claims as set forth below.